Owner's Guide

# Equipment Asepsis

adec®

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# *A Message to the Dental Professional*

Dental equipment asepsis remains one of the most confusing issues in dentistry today. A-dec is committed to giving appropriate asepsis guidelines based on these goals:

1. To encourage and support dental professionals in practicing state-of-art dental equipment asepsis.
2. To develop practitioner and patient confidence in realistic, effective, and economic dental equipment asepsis methods.
3. To provide guidance in helping practitioners protect their dental equipment investment.

A-dec continually evaluates asepsis procedures and products so that we can give information consistent with the above goals. We hope that this information proves valuable to you, and we welcome any and all comments as we continue in our efforts to meet your ever-changing needs.

If you have any comments, please call or write:

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A-dec, Inc.
2601 Crestview Drive
Newberg, OR 97132
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1-800-547-1883

Additional information on dental infection control is available from the Office Sterilization and Asepsis Procedures (OSAP) Research Foundation. Write:

OSAP Research Foundation
P.O. Box 6297
Annapolis, MD 21401
USA
1-800-298-6727

# Surface Management

*"What surface disinfectant should I use?"*
Ideally, there would be a simple answer to this question; however, with so many infection control requirements and increased concerns about damage to dental equipment, there are no simple answers.

No materials available for the manufacturing of dental equipment are impervious to every chemical, but some materials are better than others. A-dec does incorporate the most chemical-resistant materials available in its new Cascade® product line, but there are also thousands of dental units in service that were produced long before the heightened attention to infection control. Even more planning and care must be given to prevent premature damage to older equipment.

Just as there are no materials used in the manufacturing of dental equipment that will withstand every chemical, no chemical should be considered harmless to dental equipment. Even the surface disinfecting chemicals listed in previous ***A-dec Owner's Guides*** as being *"least harmful"* can damage equipment over time.

In addition to the many chemicals that are available for surface disinfecting, a wide range of methods are used by practitioners to deal with surface contamination. These methods can either decrease or prolong the life of dental equipment. For instance, some dental practices rely on frequent copious applications of disinfecting chemicals that may not only be unnecessary, but also are expensive and damaging. Other dental practices incorporate single-use barriers and disposable items that significantly reduce the frequency and need for chemical usage, thus prolonging the life of their equipment.

Besides surface disinfectants, there are many other factors contributing to dental equipment damage. Handpiece lubricants, residual sulfur in latex gloving, chemical sterilants, heat, humidity, cleaning chemicals, the applicators used to apply cleaning and disinfecting chemicals, ultraviolet light, dental treatment materials and high mineral content water are just a few other factors related to dental equipment damage. There are no simple answers for dealing with these factors and the many others that exist in dentistry.

*"Surface Management"* is a term used at A-dec to describe the collective use of products and methods to deal with equipment asepsis issues. With proper surface management techniques, effective infection control can be ensured and practitioners can protect their dental equipment from premature damage. The question shouldn't simply be *"What surface disinfectant should I use?"* The question should be *"How can I best manage the surfaces on my dental equipment?"*

## Chemicals vs. Barriers

The concerns over using chemicals versus barrier covers are common in dentistry. We recommend that each dental practice analyze its own asepsis protocol based on the following:

1. **Does your protocol include the specified wait time (usually 10 minutes) for the chemical surface disinfectant to be effective?**

   We often hear practitioners report that they couldn't possibly have their operatories down for 10 additional minutes per patient visit. So instead of following the label instructions on the disinfectant product, they "do the best they can." Any disinfecting protocol that differs from specified label instructions are equivalent to not disinfecting at all. If you are not currently waiting the specified kill-time, we recommend that you do, or that you rely upon a method of infection control that does not require the 10-minute wait time. You should be confident that your asepsis protocol is effective and not assume that a reduced kill time will always work.

2. **When determining the cost of infection control using a chemical protocol, do you include an "equipment damage" factor in the cost?**

   By spraying a dental chair with alcohol or phenolic-alcohol surface disinfectants, we estimate that in addition to the cost of the chemical, the labor to apply it, and the operatory downtime waiting for 10 minutes to elapse, each application will cost approximately \$.50-\$2.00[1] in additional upholstery damage. If you have concerns about cross-contamination on your dental chair, then we recommend that you use single-use chair barrier covers instead of causing up to \$2.00 damage for each patient visit!

[1] Based on chemical test research conducted at A-dec.

3. **Should your entire operatory be covered in plastic?**

   You should analyze where barrier covers are truly needed—on cross-contamination surfaces—then select barriers that are simple to install and create the least amount of waste.

4. **Have you identified the most economical balance between the use of chemicals and barriers to develop your asepsis protocol?** *(Make sure to consider all the costs, including the hidden costs of operatory downtime and equipment damage.)*

   The following analysis should help in your decision:[2]

   *Proper disinfecting:*

   - Requires approximately 5 minutes of pre-cleaning contaminated operatory surfaces to be disinfected.
   - Requires a "kill-time" specified on the label of the chemical disinfectant. While a few indicate a 5 minute "kill-time", most require 10 minutes.
   - Chemical cost is nearly $50 per week.
   - Accumulated damage to equipment can range between $30 and $200 per week, depending on how damaging the cleansing chemicals are.

[2] The basis for this analysis is available upon request from A-dec.

- With 10 minutes disinfectant kill-time per patient visit, total operatory down time per week is 15-1/2 hours.

  In smaller offices, this could result in fewer available schedule slots for patients. In larger offices, this can result in poor utilization of operatories.

  *Proper barrier use:*

- Requires approximately 5 minutes of removal and installation for operatory surfaces to be covered.
- Amounts to approximately $93 per week in barrier expense.
- Adds waste for disposal.

  Barrier covers typically are polyethylene products which can easily be compacted. When compacted, the total volume of 93 *"sets"*[3] (one week's volume) of barrier covers is a little over 2 gallons (1/3 cubic foot.) *The typical home garbage can holds 35 gallons.*

Even more important than any economic argument, however, is the argument of effectiveness. There should be no doubt in any practitioner's mind that the proper physical removal of a contaminated surface is more effective in breaking the chain of infection. With the many variables affecting disinfection such as proper precleaning, proper chemical coverage, proper chemical mixing, proper spray-wipe-spray technique, and so on, you can be much more confident in the effectiveness of your asepsis protocol if you incorporate the use of barrier covers.

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3 A "set" includes barriers for the headrest, chair back, delivery system control head, light handles, assistant's instrumentation holder, HVE, saliva ejector, syringes (2) and handpiece tubings (3).

**5. Are you concerned about operatory appearance when using barrier covers?**

We recommend that you use the presence of barriers to educate your patients on how you are protecting their health. We also recommend that you not apply barrier covers to surfaces that don't need them. If your patients are more confident because of your barrier protocol and you use barriers only where required, you can achieve effective infection control and protect your equipment investment. Being able to achieve all three asepsis goals *(refer to page 2)* should outweigh most of your concerns about using barriers.

## Surface Management Protocol

Keeping previous issues in mind, the following is A-dec's recommended surface management protocol:

1. **Heat sterilize all items that enter the oral cavity (or use single-use disposable replacements).**

   A-dec products that are designed for use in the oral cavity include:

   - High speed handpiece[4]
   - Tooth dryer
   - High volume evacuation (HVE) tip
   - Syringe tip

   Many other items found in the dental operatory will fall into this category as well. The items listed above are the only current A-dec products designed for use in the oral cavity.

[4] While **bur tools** are not used in the oral cavity, they are used on handpieces; therefore, they must also be pre-cleaned and heat sterilized.

2. **Identify and manage *"touch surfaces"* and *"transfer surfaces"*, reducing their number in the dental operatory.**

   *"Touch surfaces"* are those areas that require contact and become potential cross-contamination points during dental procedures. The key word is *"require"*. Many surfaces in the dental operatory could be touched during dental procedures, but only a few require touching. For example, dental lights typically are repositioned (and thus, touched) during most procedures. If only the light handle is touched during this positioning and not the housing, arm or other parts of the light, the number of touch surfaces has, in effect, been minimized. Also, the light switch could be operated with the forearm, eliminating it as a touch surface.

   Surfaces contaminated by contact with instruments or other inanimate objects are identified as *"transfer surfaces"*. Handpiece holders and instrument trays are examples of transfer surfaces. Well thought-out operatory setup and disciplined chairside procedures will contribute to reducing the number of transfer surfaces in the operatory.

3. **Use barriers (covers) on all touch surfaces and transfer surfaces (unless the surface is on an item that enters the oral cavity, which must be heat sterilized or disposed of).**

   Replace barriers between patients. Use barriers made from waterproof material. Use care to not cross-contaminate when removing a contaminated barrier cover.

4. **Use surface disinfectants on touch surfaces and transfer surfaces between patients only when it's evident that the barriers have been compromised, and once at the end of each clinic day.**

   Always follow the label instructions on surface disinfectant products, including any specified kill-time.

5. **Use mild cleaners on all *"splash and splatter surfaces".***

   *"Splash and splatter surfaces"* (also referred to as *"aerosol surfaces"*) include all operatory surfaces which are not touch surfaces, transfer surfaces, or parts of items that enter the oral cavity.

   Use surface disinfectant on a *"splash and splatter surface"* only when it has been visibly contaminated. At least once each day, clean all splash and splatter surfaces with a mild cleaning solution. Never use abrasive cleansers, brushes or scrubbing pads. Damp surfaces should always be dried with a lint-free cloth.

   Limit the touching of splash and splatter surfaces to those who wear cleaning gloves[5] while performing cleaning procedures.

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5 Do not use "latex gloves" for cleaning procedures. "Cleaning gloves" should be made from nitrile rubber.

6. **Use chair headrest barriers.**

   The adjustment knob or lever on the back of a chair headrest is a touch surface that may need to be adjusted mid-procedure and should therefore be covered with a barrier. The headrest barrier will also protect the chair vinyl from the many hair treatment products used by your patients that could damage your headrest upholstery.

   Replace headrest barriers between patients. Again, use care to not cross-contaminate when removing a contaminated barrier cover.

7. **Minimize the use of surface disinfecting chemicals on upholstery vinyl.**

   Use surface disinfectants on upholstery vinyl between patients only when barriers have been compromised.

   Use cleaning and barriers as your primary asepsis approach on chair upholstery.

   If cross-contamination on chair upholstery is a concern, we recommend the use of barrier covers for the chair instead of relying on chemicals. Barriers will significantly extend the life of your chair upholstery. *If used for infection control, barriers must be replaced between patients.*

## Cleaning

In following the recommended surface management protocol, you will focus more on cleaning environmental surfaces which are not points of cross-contamination:

Use a solution of mild non-ionic detergent and water, or commercially available cleaners containing no alcohol, bleach, or ammonia. Common dishwashing detergent is usually non-ionic.

Because the hardness of water varies from locale to locale, you should experiment to determine the best mix of detergent to water. Mix just enough detergent to allow for good cleaning without leaving a soapy film on the surface.

Never use abrasive cleansers, scrubbing pads, or other abrasive applicators because they can permanently scratch or otherwise damage equipment surfaces. Be careful in using recycled paper products, such as paper towels, that sometimes are more abrasive than first-use products.

# Surface Disinfecting

A wide variety of chemical surface disinfecting products are available for use in the dental operatory. Their availability, however, should not be construed as an indicator of either efficacy or safety to the equipment.

There are many complicating matters when it comes to selecting a surface disinfecting product. Infection control experts do not always agree on which chemical is *"the best"* for killing microbes. It is also very important to note that chemical product formulations can be changed by the manufacturers without notice. New formulations are introduced all the time. Also, government agencies will continue to monitor these products and periodically change regulations that will affect their availability. Because of the dynamic nature of the chemical surface disinfectant industry, your selection of a disinfectant should be dependent on your overall equipment asepsis protocol, instead of simply choosing a particular brand.

When considering how to prevent damage from surface disinfecting chemicals, the dental operatory should be analyzed under two categories, upholstered surfaces and all other dental equipment surfaces:

## *Upholstered Surfaces (Includes dental chairs and stools.)*

Upholstery discoloration, cracking and drying from the use of surface disinfectants is probably the most frequently discussed damage to dental equipment. The very nature of upholstery materials—soft, comfortable surfaces along with designer colors—is contrary to the application of harsh, microbe-killing chemicals.

## Iodophors

While they are famous for their orange-yellow staining, iodophors can cause the least amount of permanent structural damage to upholstered surfaces. If our recommended protocol is followed *(refer to "Surface Management Protocol")*, then a minimum number of iodophor applications will be needed. The recommended protocol, with the use of iodophors only when necessary, can prevent premature damage to upholstery when combined with routine cleaning (with detergent and water) along with the occasional use of an iodophor neutralizer[6].

## Phenolics

Phenolic surface disinfectants are available in two primary formulations, alcohol-based and water-based.

Alcohol-based phenolic disinfectants are very damaging to soft plastics such as those used in upholstery materials.

High-dilution water-based phenolic disinfectants are not as damaging as alcohol-based phenolic disinfectants. However, like all chemicals, they should not be considered "safe." But when carefully used with the Surface Management Protocol in this manual, premature damage to upholstery may be avoided.

**CAUTION**

Using most other commonly available surface disinfecting chemicals can prematurely and permanently damage upholstered surfaces.

6 Usually containing sodium thiosulfate.

## Other Dental Equipment Surfaces

If our recommended surface management protocol is followed, then the main concern is with surfaces that can contribute to cross-contamination: touch surfaces and transfer surfaces. If these surfaces are covered with barriers that are properly installed and removed between patients, the amount of needed chemical surface disinfecting will be reduced. **Only one surface disinfecting procedure is needed (at the end of the clinic day) if barriers are properly installed and removed between patients.** While the possibility of damage from chemicals is less on hard dental equipment surfaces (as compared to the damage upholstery can incur), we still recommend the more economical and effective **barrier protocol.**

The following chemicals have the most detrimental effect on A-dec dental equipment surfaces:

- 5.25% sodium hypochlorite (household bleach)[7]
- Glutaraldehyde
- Ethyl alcohol (50% or higher concentrate)
- Isopropyl alcohol (50% or higher concentrate)
- Alcohol-based phenolics

In addition, most foam spray products can cause premature damage to dental equipment.

[7] A solution of 1 part 5.25% sodium hypochlorite (household bleach) to 9 parts water is recommended to disinfect the internal components of the A-dec Self-contained Water System. Refer to **Self-contained Water System Owner's Guide,** A-dec Publication No. 85.0675.00.

## Upholstery Cleaners and Conditioners

Much confusion exists over whether or not the many available commercial upholstery cleaners and conditioners should be used on dental chair and stool upholstery. These products, many of which are silicon-based, were developed primarily for the automotive industry. While they improve appearance and are gentle to upholstery materials, they may complicate the cleaning and disinfecting process by creating inconsistent surface characteristics on the upholstery. One part of the upholstery might be sealed with silicon and another part may not. This may affect the efficacy of surface disinfectants.

Hundreds of upholstery cleaners and conditioners are designed for upholstery material, and are formulated from many different chemicals. Whatever chemical product you choose, you should first experiment on an upholstery surface that is hidden from view to determine if there is any negative interaction.

# *Identification of Symbols*

Recognized by Underwriters Laboratories Inc. ® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Recognized with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1.

UL listed to US (UL 544) and Canadian (CAN/CSA C22.2, No. 125) safety standards.

Classified by Underwriters Laboratories Inc. ® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Classified with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1.

Conforms to European Directives
*(refer to Declaration Statement)*

Protective earth (ground).

Functional earth (ground).

Attention, consult accompanying documents.

TYPE B APPLIED PART.

CLASS II EQUIPMENT.

**Type of shock protection:**

# *Classification of Equipment (EN 60601-1)*

CLASS I EQUIPMENT
(Dental Chairs, Dental Lights, & Power Supplies)

CLASS II EQUIPMENT
(Chair, Wall, & Cart Mounted Delivery Systems)

**Degree of shock protection:**
TYPE B APPLIED PART (All products)

**Degree of protection against water ingress:**
ORDINARY EQUIPMENT (All products)

**Mode of operation**
CONTINUOUS OPERATION
(All models except Dental Chairs)

**Mode of operation**
CONTINUOUS OPERATION WITH
INTERMITTENT LOADING (Dental Chairs)

**Environmental**

Storage - Temperature: -40°C to 70°C (-40°F to 158°F)
Relative Humidity: 95% maximum

Operating - Temperature: 10°C to 40°C (50°F to 104°F)
Relative Humidity: 95% maximum

**Electromagnetic Compatibility**
This equipment has been tested and found to comply with the
limits for medical devices in IEC 601-1-2:1994. These limits are designed to provide reasonable protection against
harmful interference in a typical medical installation. Contact A-dec Customer Service if you have any questions.

**Flammable Gasses**
Not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide.

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